THE

AMERICAN REVIEW OF TUBERCULOSIS
ABSTRACTS OF TUBERCULOSIS

VOLUME XXIV SEPTEMBER, 1931 ABST. NO. 3

CONTENTS

PAGES

Diagnosis (*concluded*) 65–66
Tuberculosis of Organs Other than Lungs 66–82
Treatment 82–88
General, sanatorium, etc. 82–85
Surgical (collapse therapy, cauterization of adhesions, etc.) 85–88

Vernes Test.—During the last twelve months an investigation as to the value of the Vernes test, both in diagnosis and prognosis, has been carried out. Of 350 sera examined, 200 were from proved cases of tuberculosis, while 150 were from persons suffering from disease other than tuberculosis. In addition to these, 25 sera from normal individuals were examined. The technique of the resorcin test is as follows: In a chemically clean test-tube is placed 0.6 cc. of serum; to this is slowly added 0.6 cc. of 1.25 per cent resorcin in doubly distilled water, and the optical density of the resultant mixture is immediately determined in the Vernes-Bricq-Yvon photometer. It is advisable to carry out the test on another 0.6 cc. of the same serum to serve as a control. If the reading obtained in the control varies by more than 3 per cent the results cannot be relied on. The mixture is then allowed to stand at room temperature for four hours and the optical density is again determined. The difference between the second and the first reading is the photometric figure for the test. Vernes states that a figure below 15 is given as a rule, when a person is not affected by tuberculosis, while the probability of existence of tuberculosis becomes greater as 30 is approached. From the results obtained in the above cases it seems reasonably certain that when an optical density below 40 is obtained, active tuberculosis can be definitely excluded, but the opposite does not apply, and a high figure is obtained in all pyrexial conditions, particularly where there is such tissue destruction as occurs in bone and joint disease. Several of these cases showed figures exceeding 90, while one case of rheumatoid arthritis gave a figure as high as 158. As the condition of the patient improves the density figure drops as in the phthisis cases. Another group of cases investigated was suffering from typhoid fever. An average figure of 55 was obtained in the second and third weeks of infection. Advanced malignant disease usually produced a figure of over 100. Cases of furunculosis and carbuncle gave an average figure of 55. The normal sera gave figures below 15 with one exception. This case, after giving an index of one, was retested while suffering from a common cold. The figure then obtained was 77 and after recovering it dropped to 2. In a case of asthma an index of 50 was obtained during an asthmatic attack, while under normal conditions the index was 28. The sera from active cases of tuberculous joint disease, tuberculous peritonitis and renal tuberculosis gave an average figure of 103. Six sera from patients with inactive disease but with tubercle bacilli in the sputum gave figures below 15, varying between 4 and 13. It is evident, therefore, that the test is of no practical value in inactive cases of tuberculosis. Serial tests show that the Vernes reaction is a valuable guide in prognosis. The index gives information of the

imminence of an exacerbation in advance of the thermometer and the general condition of the patient. A typical case which is not responding to treatment gives indices at monthly intervals as follows: 100, 112, 100, 105, 100, 130, while in a favorable case they run thus: 80, 72, 63, 53, 41, 31. These features also appear in the erythrocyte sedimentation test, and a comparison was made of the results of the two tests. In 130 sera, including cases of pulmonary tuberculosis, doubtful cases, and normal persons, practical agreement was found in 90 per cent, not only in the interpretation of the numerical values for both tests, but also in the clinical and X-ray findings. Fahraeus observed that the sedimentation rate was increased not only in tuberculosis but also in all kinds of infection, most distinctly when accompanied by high fever and in many cases of malignant tumors and certain forms of psychosis. Such conditions also produce an increase in the resorcin figure. The natural corollary to this close agreement of the two tests appeared to be that the same factor produced these phenomena. Sedimentation is undoubtedly due to the action of haemagglutinins. These are in turn probably dependent on the presence of protein in the plasma. A reduction in the suspension stability of blood is brought about by the increase in the fibrinogen or globulin protein fractions. To determine whether the diminished stability of the blood and the increased optical density with resorcin are due to a common factor, a series of determinations of the total protein, the total globulin and the Vernes index were performed on 22 different sera. The results show that the Vernes test is dependent neither on the percentage of globulin nor on the proportion of globulin to total protein. The most that can be said is that there is a general trend for the globulin to increase as the optical indices do. During the course of this work an attempt was made to apply the test to the blood of cattle and laboratory animals. No results of diagnostic value were obtained. One hundred specimens of cerebrospinal fluid were examined and positive results were obtained in cases of tuberculous meningitis. In all cases in which a globulin increase occurred a raised optical index was recorded. As in the case of the blood, the chief value of the test appears to be in a negative result. *Conclusions: 1:* The Vernes test cannot be considered specific for tuberculosis. *2:* Its chief value in diagnosis is that a figure below 30 contraindicates active tuberculosis; the converse does not obtain. *3:* The results are very valuable in prognosis and as a guide to treatment. *4:* A persistently high figure, despite apparent clinical improvement and diminished activity, indicates an unfavorable prognosis, while a low figure accompanying an active condition permits of a more hopeful outlook. *5:* Exacerbations and the return of activity are foreshadowed by a raising of the index before any change in the general condition of the patient or in the temperature chart are observed. *6:* The test has no value in the diagnosis of tuberculosis in animals. There is close agreement between the Vernes resorcin test and the sedimentation rate of the red cells, and both probably depend on the altered colloidal lability of the blood in tuberculosis.—*The Vernes Resorcin Test and Tuberculosis, R. S. Ralph and G. I. Davees, Lancet, June 28, 1930, ccxviii, 1397.*—(*F.G.P.*)

Vernes Test.—This test was performed on 64 cases of tuberculosis at fortnightly intervals during their stay in the hospital, a total of 317 tests being performed. In this group there were 36 pulmonary and 28 nonpulmonary cases. In addition, for purposes of control, tests were done on 15 cases of scarlet fever and 17 cases of diphtheria. *Summary and Conclusions: 1:* The findings in the series of tuberculosis cases and in the control series show that the test cannot be regarded as specific for tuberculosis. *2:* In 64 cases of pulmonary and extrapulmonary tuberculosis the serial tests corresponded with the clinical course of the disease in 59, and hence a progressive decline in the figures obtained was found to be of good prognostic value. *3:* The sera from healed cases of tuberculosis, whether pulmonary or nonpulmonary, show readings below 30, and a Vernes reading below 30 is a good measure of the inactivity of the lesion. *4:* Nonpulmonary cases of tuberculosis generally show Vernes readings below those obtained in pulmonary cases. In bone disease, when there is extensive destruction of tissue, the readings are, however, fairly high. *5:* The results obtained in cases of scarlet fever and diphtheria indicate that the amount of flocculation obtained varies with the stage and degree of severity of the illness.—*The Vernes Resorcine Test in the Diagnosis and Prognosis of Tuberculosis, J. W. Lobban, Brit. J. Tuberc., January, 1931, xxv, 11.*—(*E. H. K.*)

Tuberculous Iritis.—A man aged 64 with retinitis pigmentosa, blind for more than 20 years, developed in one eye acute fibrinous iritis clinically similar to acute "rheumatic" iritis. Roentgen examination of the chest showed marked evidences of old pulmonary tuberculosis. There was no cough or elevation of temperature. On account of pain the eye was removed about five days after the onset of the subjective symptoms. Microscopic examination

showed small recent tuberculous foci in the iris which had given rise to a fibrinous exudate in the pupil. The acute reaction may have been due to an allergic condition of the patient toward tuberculous toxins. Since the case does not conform to any type of tuberculous iritis hitherto recognized, it suggests that some, possibly many, cases of supposed "rheumatic" iritis are due to tuberculosis.—*Acute Tuberculous Iritis: Microscopic Examination of an Eye Showing This Condition, F. H. Verhoeff, J. Am. M. Ass., August 23, 1930, xcv, 583.*—(*G. L. L.*)

High Frequency Current in Lymph-Node Tuberculosis.—Daily applications of high frequency current to tuberculous lymph nodes is followed by absorption and disappearance in 60 per cent of the cases. A marked diminution in size occurs in 16 per cent. These changes are observed from fifteen days to two months after treatment. In some of the lymph nodes healing takes place by a proliferation of the reticulum cells with atrophy of the follicles and lymph-vessels. In others there occurs a transformation of the reticulum cells into new connective tissue.—*L'azione della corrente elettrica alternata di alta frequenza sui nodi linfatici tubercolari, S. Massimi, Tubercolosi, December, 1928, xx, 477.*—(*U. E. Z.*)

Treatment of Tuberculous Laryngitis by Reflected Sunlight.—The author uses a polished metal mirror for reflecting sunlight into the larynx, thus avoiding reflection by glass and absorption of therapeutic rays. This ensures a greater raying intensity and a shorter raying period. Reflected sunlight is used in treatment, beginning with a 4-minute daily raying, and increasing by 2-minute intervals until 30 minutes have been attained.—*Zur Technik der endolaryngeal Bestrahlung der Kehlkopftuberkulose mit reflektiertem Licht, K. Riemer, Zeitschr. f. Tuberk., 1930, lx, 319.*—(*H. J. C.*)

Tuberculous Pleuritis.—Tuberculous pleuritis may occur concomitantly with the development of the primary complex, by haematogenous spread, as an associated phenomenon with haematogenous foci in the pulmonary parenchyma or in combination with progressive pulmonary tuberculosis. Cases in which tuberculous pleuritis is caused by an active tuberculosis of the bronchial lymph nodes are not rare. Haematogenous metastases produce the clinical picture of recurrent, dry pleuritis or of unilateral or bilateral exudative pleuritis and of polyserositis. The dry, recurrent pleuritis (*pleurite à répétition*) is characterized by recurrent attacks in intervals of weeks, months or years. The lung may not show any involvement or it may show the signs of haematogenous lesions. This pleuritis is most frequently found in the apical parts, along the anterior pulmonary borders, around the lingula, in the interlobar fissures and over the bases. The clinical significance of this pleuritis is the fact that it indicates the existence of an active focus somewhere in the body, frequently a not healed primary complex, or it may indicate that the patient is more or less continuously exposed to a source of infection. The tuberculous exudative pleuritis produces the same physical signs as pleuritides of other aetiology. The exudate is characterized by a predominance of lymphocytes, with the exception of the earliest phases, during which polymorphonuclear leucocytes may predominate. It may be sanguineous, the same as in tumors and syphilis. Tubercle bacilli are rarely found microscopically; they are demonstrable by animal inoculation in those cases in which the exudate is not only the product of a collateral inflammation. The onset of the disease may be insidious and uncharacteristic, the duration is very variable. Pleural adhesions are usually formed as results of the exudative inflammation. If the pleuritis is localized along the diaphragm, the symptomatology may call for a differential diagnosis between cholelithiasis, nephrolithiasis and appendicitis. Diaphragmatic pleurisy is more frequently caused by subphrenic inflammatory disease than by a tuberculosis of the pleura. Tuberculous polyserositis has frequently been diagnosed as a rheumatic disease. In cases with rheumatic arthritis and endocarditis the rheumatic aetiology may be correct. In the late stages of the disease pleural, pericardial, and peritoneal adhesions are formed. Tuberculous pleuritis exerts frequently a favorable influence upon a pulmonary lesion. This fact has been explained by the mechanical compression of the diseased lung, but it is likely that the exudate contains antibodies which influence the disease immunobiologically, and the fibrosis which develops after the exudate has a beneficial effect on pulmonary foci. An exudate should not be allowed to exist too long because extensive adhesions should be avoided. Tuberculin therapy is highly recommended and should be combined with puncture if the exudate is very large or exists too long.—*Ueber die tuberkulöse Pleuritis, J. Donath, Wien. klin. Wchnschr., October 30, 1930, xliii, 1347.*—(*M. P.*)

Roentgenology of Pleuritis.—Inflammation of the serous covering of the diaphragm, pleura or peritoneum, produces alterations in the diaphragm which gives rise

to marked symptoms. Affections of the diaphragm are caused either by direct contact with the diseased tissue or indirectly by reflex action. Roentgenological alterations of the diaphragm are expressed in its shape, its position and its movements. Not all cases of pleuritis produce roentgenologically demonstrable diaphragmatic changes. On the affected side the diaphragmatic movements are usually limited. The limitation may be bilateral but is usually more pronounced on the affected side. The tone of the diaphragm is usually decreased; this may cause an increased curvature. Diaphragmatic pleurisy is apparently frequently not tuberculous. It may be caused by an inflammatory lesion of the peritoneum or by basal bronchopneumonic foci. The characteristic finding is the high position of the diaphragm and decreased motility. The curvature is usually unimpaired. Paradoxical motion is observed in some cases. Since the same findings exist in diaphragmatic pleuritis and in local inflammatory lesions of the peritoneum, it is unlikely that the phrenic nerve causes the abnormal findings. Histological examination in such cases shows an inflammatory infiltration of the musculature and cloudy swelling. There is no reason to describe diaphragmatic pleuritis as an independent clinical entity. In exudative pleuritis the outline of the diaphragm is usually not visible and it is apparently fixed. The sequellae of acute diaphragmatic pleurisy are diaphragmatic adhesions. They are manifested roentgenologically by an obscured phrenicocostal angle and by tenting. The roentgenological findings may be perfectly normal in spite of massive adhesions. Adhesions without acute inflammatory lesions produce practically never a complete loss of motion. In extensive pleural adhesions breathing exercises are indicated in order to prevent impairment of cardiac function. It is suggested that many patients with vague respiratory complaints have post-pleuritic adhesions.—*Das Röntgenbild des Zwerchfells bei Pleuritis, K. Hitzenberger, Klin. Wchnschr., September 13, 1930, ix, 1732.*—(*M. P.*)

Pleural Effusions.—A clear effusion may be a simple oedema occurring most frequently in cardiac disease. It is a transudation of low specific gravity, noninflammatory in nature, and associated with oedema elsewhere in the body. It should be removed when it causes distress, as it shows little tendency to absorption. On the other hand, a clear effusion may be an exudate, with a higher specific gravity and a firmer clot. It is the result of a tuberculous process. It is proof of an underlying lesion demanding long and serious treatment. Physical signs may vary. Breath-sounds may be absent, weak or altered. Whispered pectoriloquy and bronchial breathing are commonly present. If doubt exists as to the presence of fluid, an exploratory needle should be used. The treatment consists of rest in bed until all constitutional symptoms have subsided. Aspiration of the fluid is indicated only in case of distress due to pressure. Normal activities of the patient should not be resumed for three to six months. Haemorrhagic effusions are found as a result of new growths but are not infrequent in tuberculosis. When a purulent effusion is suspected, an exploratory needle should be used and the causative organism identified if possible. Pneumococci, streptococci and tubercle bacilli are the common organisms. When pus is found, open operation should not be countenanced till the process has subsided: which means, in pneumococcal cases, after the crisis; in streptococcal cases, three weeks or more from the onset of the illness; and in tuberculous cases, never.—*Pleural Effusions in General Practice, W. A. Dickson, Brit. M. J., December 20, 1930, no. 3650, 1036.*—(*M. E. P.*)

Pleural Effusions.—Pleural effusions, unless adhesions are present, move freely with change in position of the thorax. In a new position for roentgen examination of pleural effusions, as described by the author, the patient lies on the affected side, the film being in front and the X-ray tube behind. Small effusions, which are entirely invisible in the usual positions, may be readily detected in this lateral decubitus position. Pleural thickening may be distinguished from a small pleural effusion by the use of this position. With change in position of the thorax, a free pleural effusion may extend into the interlobar fissures, giving the appearance of an encapsulated interlobar effusion. This phenomenon may also be used to differentiate fluid from pleural thickening.—*Roentgen Diagnosis of Small Pleural Effusions: A New Roentgenographic Position, L. G. Rigler, J. Am. M. Ass., January 10, 1931, xcvi, 104.*—(*G. L. L.*)

Examination of Pleural Adhesions by Transmitted Light.—The author introduces two thoracoscopes into the chest on opposite sides of adhesions, and examines the adhesions by means of transmitted light from the lamp of one of the thoracoscopes. In this way it is possible to observe dense adhesions and learn something regarding their contents. Large vessels and cavities as well as lung tissue contained in the adhesion are readily discerned and the most suitable place for severing the adhesion

is also discovered. If the adhesion cannot be seen by transmitted light it is advised not to sever it.—*Über die Untersuchung von Pleuraadhäsionen im durchfallenden Licht, K. Heine, Beitr. z. Klin. d. Tuberk., 1930, lxxiii, 263.*—(*H. J. C.*)

Pleurotomy in Tuberculous Pleurisy.—Whether or not surgical drainage of a purulent tuberculous pleurisy should be undertaken depends upon the extent and degree of activity of the pulmonary lesion. In some cases, with massive effusions, the pulmonary lesion is often very slight and in these cases drainage serves a very useful purpose.—*La pleurotomie dans les pleurésies tuberculoses. Résultats éloignés. La raison des échecs, Renaud Miget and Petit-Marie, meeting, Soc. Méd. des Hôp., November 8, 1929, reported in Progrès Méd., November 23, 1929, no. 48, 2068.*—(*U. E. Z.*)

Spontaneous Pneumothorax.—The left side is more frequently affected. Thickening and adherence of the pleura tend to prevent spontaneous pneumothorax in pulmonary tuberculosis. In a typical case o complete spontaneous pneumothorax blowing or cavernous breath-sounds over a small area, musical râles or metallic tinkling, and the coin-sound may be heard. The coin-sound, however, is often absent. Patency of the pulmonary opening is indicated by the presence of cavernous breath-sounds and their absence indicates closure. Tubercle bacilli are often present in the effusion occurring in spontaneous pneumothorax, seldom in the ordinary pleural effusion, occurring in tuberculosis. X-rays are often of little help in the diagnosis of partial pneumothorax unless fluid is present. Spontaneous pneumothorax in tuberculosis appears to be more common in cases having an artificial pneumothorax. Hutchinson and Blair claim that in cases of spontaneous pneumothorax complicating artificial pneumothorax which recover, a typical temperature curve may be found, as follows: *1:* A steep initial rise of temperature coincident with the first symptoms. *2:* A fall by lysis, in which the previous daily variation is roughly preserved. *3:* When the initial rise is to about 104° the normal is reached in about three weeks; if to about 103° it is reached in about two weeks. Recovery in cases of spontaneous pneumothorax is the rule if the previous health was good. Spontaneous pneumothorax must be regarded as one of Nature's ways of curing pulmonary tuberculosis, for acute extension of the disease cannot take place in a collapsed lung. When the presence of positive pressure is suspected a trocar and cannula may be passed into the chest and a gauze pad fixed over its end. If positive pressure is present a puff of air is heard and symptoms are relieved on withdrawing the trocar. It is better to determine the pressure by the use of a manometer. Replacement of effusions with air prevents the formation of adhesions. Three nontuberculous cases are reported. In two the causative factor was presumed to have been the rupture of an emphysematous bulla, though generalized emphysema was not demonstrated. In the third case spontaneous pneumothorax complicated asthma, a rare occurrence. A fourth case described was one of pulmonary tuberculosis with artificial pneumothorax complicated by spontaneous pneumothorax. Three roentgenograms of cases described are reproduced.—*Spontaneous Pneumothorax, H. E. Symes-Thompson, Lancet, October 11, 1930, ccxix, 791.*—(*R. M. F.*)

Spontaneous Pneumothorax.—Five cases of spontaneous pneumothorax are reported in patients in whom no pathological change of the lung was demonstrable. All five recovered completely and returned to work. The most common aetiological factor responsible for the development of spontaneous pneumothorax, taken as a whole, is tuberculosis. Records show this to be the cause of about 80 to 90 per cent of the adult cases and 40 to 50 per cent of cases in children, the discrepancy being due to the fact that there are more cases in children due to acute infectious diseases. Various ideas have been formulated regarding the aetiology of the idiopathic group. Some state that these cases are probably due to a tuberculous infection in which there are no physical signs and no positive roentgen evidence. The theory has also been advanced that a tuberculous process is present and causes the rupture, and that the collapse and rest of the lung allow this process to heal entirely without leaving any scar-formation. Others think the condition due to the rupture of an emphysematous bleb on the margin of the lung. Still others think that probably there has been some inflammatory condition causing adhesions between the visceral and parietal pleurae and that unusual exertion causes this adhesion to be torn loose, thus causing a rupture. This type of case rarely ends fatally. The condition often occurs while the patient is at rest or even asleep. The uncomplicated cases usually clear up in from two weeks to two months but may last much longer. One case has been known to exist for twenty years. Recurrence of the pneumothorax is not uncommon. One case is reported in which there were eleven recurrences. In another there were eighteen recurrences during a period of eight years.—*Spontaneous*

Pneumothorax, J. P. Palmer and R. B. Taft, J. Am. M. Ass., February 28, 1931, xcvi, 653.—(G. L. L.)

Asymptomatic Spontaneous Pneumothorax.—Six cases of this condition are reported. The lesion in all was discovered in the course of the routine examination of patients known to be suffering from pulmonary tuberculosis. In none of the cases was there elicited a history of pain in the chest or dyspnoea, the patients being unaware that anything untoward had happened. In 5 cases the percussion note was impaired over the area of pneumothorax, this being due to pleural thickening and adherent pleura. In one case the percussion note was hyperresonant and the breath-sounds were absent, but in the remaining cases breath-sounds were of a soft, distant, amphoric type. Metallic râles were present in 4 cases. Fluid occurred in 3 cases and cardiac displacement was noted in two. In 5 the diagnosis was confirmed by X-ray. It would appear that "latent pneumothorax," as termed by Fishberg, is more common than is usually supposed. In view of there being a fair amount of lung tissue already destroyed, the occurrence of a spontaneous pneumothorax would not materially affect the good tissue remaining. In chronic cases the amount of lung collapsed will be limited by adhesions and fibrosis. A sudden collapse did not occur in any case, apparently only a small portion of the lung being involved at the beginning. Cardiac displacement occurred only twice. It was gradual and caused no circulatory embarrassment or dyspnoea.—*Symptomless Spontaneous Pneumothorax, J. R. Beal, Brit. J. Tuberc., January, 1931, xxv, 21.—(E. H. K.)*

Roentgenography of Mediastinum.—In roentgenological examination of the mediastinum, true lateral views are much more satisfactory than oblique views, and both lateral and anteroposterior views are necessary. Anterior or posterior displacement of the trachea is often quite as important as lateral displacement and can be appreciated in lateral plates only. Tumors of the oesophagus, trachea or other mediastinal structures, cardiospasm, aneurysms, Hodgkin's disease, tuberculosis of the tracheobronchial lymph nodes or of the spine, mediastinal abscess which has developed from either of the last-named infectious processes, and possibly several other local conditions may be diagnosed and accurately localized by means of lateral views of the chest. It is an exceedingly helpful manoeuvre.—*Radiological Study of the Superior and Posterior Mediastinum, S. Brown and H. G. Reinecke, Am. J. Surg., December, 1930, n. s. x, 452.—(H. S. W.)*

Secondary Intestinal Tuberculosis.—The extraordinary frequency of tuberculous intestinal lesions in patients with pulmonary tuberculosis (necropsy statistics show an incidence of about 80 per cent) make its determination an important factor in prognosis. There are even a certain number whose pulmonary disease alone is curable yet who die of intestinal tuberculosis. The old classical picture of continued diarrhoea in a hectic advanced phthisical patient with cavitated lesions is a terminal one. Jacquerod was among the first to insist on the need for earlier diagnosis and on the fact that the onset of this complication may take place irrespective of the stage of the pulmonary disease; also that certain forms were amenable to surgical extirpation. Roentgenography has been the means of great advance in earlier diagnosis and demonstration of the extent of the lesions. Two pathological points are of interest: *1:* The site of onset, which in 85 per cent of cases is near the ileocaecal junction, involving the terminal ileum and caecal wall about the valve of Bauhin. *2:* The differentiation of types into (1) the hypertrophic form, generally considered as primary but often met with in association with active pulmonary disease, and (2) the secondary diffuse form. Mixed forms are common, such as (3) the ulceroinfiltrative, and (4) the localized ulcerative. The ulceroinfiltrative forms give rise to extensive "surgical" tumors. The localized ulcerative show a few isolated ulcerations, capable of spontaneous cure with formation of a fibrous placque which may or may not cause stenosis, or there may be little groups of ulcerations in the terminal ileum or caecum. Either form must be recognized early if surgery is to have a chance of success. In general it may be said that intestinal tuberculosis is a complication of the second or third year of pulmonary disease. *General Signs and Symptoms:* Fever and emaciation may occur at the onset. One thinks first, of course, of a pulmonary exacerbation, and even in the absence of auscultatory signs hesitates to rule it out. However, there are cases in which the hypothesis of pulmonary activity is unsatisfactory: cases of effective pneumothorax, in which there is no evidence of a pleural reaction or bilateralization. The fever is apt to assume a type emphasized by Jacquerod. It is at a maximum postprandially. Some patients with intestinal lesions in whom the temperature curve at first appears normal will show within two hours after a meal a little elevation to 37.5° or 38°C. The temperature curve also may present irregularities from one day to another, unlike the regular cyclic form of the curve due to fever of pulmonary origin. Emacia-

tion, or merely the failure to gain weight under suitable conditions, should be viewed with suspicion. *Gastrointestinal Manifestations:* Anorexia is one of the most important of these, despite its banality. When it appears without there being any pulmonary exacerbation, in a patient at rest under good hygienic conditions, who has previously eaten well, and resists all treatment, it is most suggestive. This anorexia may be associated with such dyspeptic symptoms as heaviness, eructations, facial congestion, somnolence, and, rarely, vomiting. Gastric roentgenographic studies are negative and gastric therapeutic measures have no effect. These troubles arise reflexly from the intestine, and surgical ablation of lesions there causes them to disappear. Diarrhoea is, of course, a symptom which arouses suspicion of intestinal tuberculosis. It generally consists of three or four stools a day, sometimes all in the morning, one after another. Again, eating may cause a desire to defecate, especially when there are lesions of the transverse colon. More rarely the stools occur in the afternoon or evening, six of seven hours after taking food; this is especially characteristic of diffuse lesions. Still other times a flock of ten or fifteen loose stools occurs in the midst of an attack of constitutional signs (including high temperature and enlarged spleen) suggesting a general sepsis. One such case terminated six months later by multiple intestinal perforations. Perhaps the most common occurrence is one soft copious stool in the morning. Among the gamut of diarrhoeas may be mentioned a dysenteriform syndrome, consisting of liquid, frothy and foetid stools, which cause burning about the anus in their passage. Patients sometimes liken their appearance to that of dirty water. They do not contain mucus or blood. However, diarrhoea is one of the most untrustworthy symptoms, because it may often be absent in the presence of definite lesions, or again may be present without such lesions. Instead of diarrhoea, constipation may exist. Ileocaecal tuberculosis, at its onset, by causing infiltration of the valve of Bauhin, sometimes considerably retards the emptying of the small intestine. However, when caecal ulcerations occur, the picture changes, even though ileal stasis persists. As to pain, few cases of intestinal tuberculosis develop without some pain. The most common type consists of colicky pains before defecation, or during the act. Sometimes there is postprandial pain, or pain while eating. Or, pains may be felt some hours later, associated with flatulence. There is also very frequently a more fixed yet vague pain, almost always located in the right iliac fossa. Such pains may give rise to the erroneous diagnosis of chronic appendicitis. Haemorrhage: outside of large haemorrhages, due to erosion of vessels, bleeding does not occur. Occult haemorrhage is practically never seen. *Physical Signs:* While there may be no physical signs made out, it is unusual that careful palpation does not reveal something. Quite often a small glandular mass or thickening is discernible in the ileocaecal region. This may be due rather to a spastic contraction, giving the impression of a tumor under the hand. There is also commonly a painful point near McBurney's point. Palpation under the fluoroscope may help to localize it. This brings to mind the caution that every appendicectomy in a tuberculous patient should be made the occasion for a careful exploration of the caecum and terminal ileum. *Laboratory Findings:* Search of the stools for tubercle bacilli is of little value unless the sputum is negative for them, because it is almost impossible to prevent some being swallowed. Search for blood is useless, as mentioned. Intestinal tuberculosis does not bleed (with the rare exception of massive haemorrhage due to erosion). Coprological study may show various digestive insufficiencies, due in part to rapidity of transit in certain portions of the intestinal tract. *Roentgenography:* This serves two ends to recognize the existence of lesions and to localize them. Knowledge of their site and extent is indispensable in determining operability. In carrying out this examination, the patient is prepared with charcoal and atropine and the morning of the examination receives 200 gm. of gelobarium. He is then studied at the seventh, tenth and fifteenth hours afterwards. This is repeated a few days later in order to recheck the findings. There are recognizable, first, *motor disturbances*. Of these, ileal stasis comes first. At the seventh hour the caecum is still empty and the small intestine has not completely emptied itself at the twelfth hour. To be of real value, ileal stasis should be associated with colonic hyperkinesis. Thus, a part of the meal may arrive at the sigmoid before the small intestine is emptied. Second, we have lesional images. In the case of the small intestine these cannot be determined; but, since 85 per cent of cases have ileocaecal lesions, it is here one seeks for early changes. Stierlin's image is an interruption between two clearly defined segments, characterized by absence of well-marked contour and quasiabsence of the barium meal. Vacuolar images and deformity of contour are also not infrequent and quite significant. On the internal border of the caecum, near the implantation of the ileum, there may be a deep depression; or

the last few centimetres of the ileum may have a rough, filed appearance. These images may be associated with violent peristaltic waves. These signs indicate infiltration of the valve of Baughin and its resistance against the struggles of the ileum. There is, however, no real stenosis. Alterations of the caecal contour, especially near the region of the appendix, are common with tuberculous lesions, although not specific. Obliteration of the sacculations of the external caecal wall is an important sign, the border then becoming roughly rectilinear, or more rarely, angular or interrupted. This is especially characteristic of the hypertrophic forms, without ulceration. Discrete lesions of the mucosa, precursors of ulceration, usually cause an irregular, dentate outline, like the border of a postage stamp. In the vicinity of these abnormal images there is usually pain, sometimes described as burning in character. Neither palpation nor administration of atropine modifies these images. *Clinical Course:* The first stage may last several months but is usually shorter, more often only of two or three weeks' duration. Careful questioning of these patients nearly always discloses loss of weight, impairment of the general condition, dyspeptic or diarrhoeal symptoms, perhaps associated with elevations of temperature. Such episodes as sudden vomiting, diarrhoea, right iliac pain and temperature, have been described by Burnand under the term *poussées caecales tuberculeuses*, to which Bonnamour and Bernay prefer the term *poussées intestinales évolutives*. Such attacks are not necessarily followed by extension of the lesions; sometimes there is rather a tendency to limitation. However, intestinal tuberculosis is characterized by this sort of *evolution par poussées*, and these are remarkably independent of the pulmonary process. The second stage of the disease manifests itself by the classical signs: frequent and intractable diarrhoea, persistent or frequent abdominal pain, with rare and short remissions, especially the subacute forms. But whether acute or chronic, the lesions are too diffuse and numerous by now to permit of ablation. Although absence of diarrhoea does not exclude extensive lesions, a dysenteriform syndrome, the presence of mucous stools, is a good indication that involvement is not limited to the right colon. Probable signs of considerable involvement of the small intestine are acceleration of transit as recognized both by roentgenography and coprological study. *Treatment:* That the above contraindications (extensive lesions, severe symptoms) are not absolute is shown by the authenticated cures following simple laparotomy, especially if the opening is large. However, to justify even this, the pulmonary lesions must be stabilized and a fair state of nutrition must be present, because of the fact that any operative procedure entails loss of weight. With these reservations, the only logical treatment is a surgical one, looking toward either removal or exclusion of the lesions. Complete cure can only be realized in the case of isolated ulcerations or infiltrations. It is very difficult to decide before operation on the best procedure. The appearance of the peritoneal aspect of the intestine is an unsatisfactory guide, because many ulcerations are undiscoverable by this method. There are, however, three possible changes of the peritoneal aspect which often go with intestinal lesions: (1) localized thickening, (2) a violaceous red congestive placque, with some granulations, and (3) simply a thinning out, giving a shriveled or wrinkled appearance. Visible or palpable changes, as mentioned, are not constant, and in fact are absent in about one-half of the cases. Thus it is necessary to fall back on the roentgenographic changes as a guide, although certain lesions, especially lenticular ulcerations, may escape even this method of examination. The incision should be made as far away as possible from known lesions and yet be accessible to them, because of the possibility of cutting into inflammatory and ulcerated tissues. Lesions not amenable to surgical treatment may be considered beyond reach of any therapy. This despite the favorable reports of Brown and Sampson and others under heliotherapy. Bonnamour and Bernay have tried out this method and find in a certain number of diarrhoeal cases a temporary recrudescence, usually followed by an equally temporary amelioration and gain in weight; but they have never seen any modification of the roentgenographic picture. All such cases, they add, were well advanced. Roentgenotherapy also, according to Brown and Sampson, may yield striking results, but they have not observed any such. Some medication is necessary for symptomatic control. They do not believe the diarrhoea to be entirely due to the ulcerations, but, as Brunand and Terret suggest, there is a concomitant enteritis related to sympathetic-nerve disturbances and perhaps in a measure to hepatic or pancreatic deficiency. This would explain the therapeutic successes obtained with a variety of remedial agents and the common necropsy finding of extensive colonic ulcerations which never caused any diarrhoea. For this reason such medicinal agents as the following are suggested: extract of hog's stomach, phosphoric acid, calcium carbonate and other intestinal absorbent powders. Many diarrhoeas associated with intestinal ulcerations

are relieved by these or even disappear entirely.—*Signes de début de la tuberculose intestinale chez les tuberculeux pulmonaires, S. Bonnamour and P. Bernay, Rev. d. l. Tuberc., October, 1930, xi, 873.—(A. P.)*

Intestinal Tuberculosis.—Hyperplastic tuberculosis of the terminal ileum alone, without coëxisting involvement of the caecum, is extremely rare. Involvement of the duodenum in the same process has never hitherto been reported. A case is reported of a man, aged 24, who presented gastrointestinal symptoms over a period of five years, finally definitely diagnosed tuberculosis of the terminal ileum and duodenum after an exploratory laparotomy, when the ileum was found markedly thickened for 15 cm. from the caecum, which was uninvolved, and the duodenum was also markedly thickened and studded with tubercles. Stereoroentgenograms and repeated examinations of the chest were all negative. Tuberculosis of the intestines exists in four forms: (1) the common ulcerating type; (2) the stenosing or cicatricial type, resulting from healed ulcer (3) the enteroperitoneal type; and (4) chronic hyperplastic tuberculosis, of which there are two types, namely, the ulcerating and the hypertrophic, the latter being described as the real surgical tuberculosis. The site is most frequently ileocaecal, the tumor mass often resembling carcinoma. It is a disease of long duration. Masson and McIndoe believe the chronicity and low grade of inflammation to be due either to an attenuated bacillus, or to one of low virulence elaborating small quantities of exotoxin sufficient to produce proliferation and not necrosis. Radical resection of the affected segment and intestinal anastomosis afford the only recourse.—*Hyperplastic Tuberculosis of the Duodenum and Terminal Ileum: Report of a Case, J. D. Garvin, J. Am. M. Ass., November 8, 1930, xcv, 1418.—(G. L. L.)*

Ileocaecal Tuberculosis.—Ileocolography, using a double contrast air-barium is described in the study of ileocaecal tuberculosis. These examinations are more valuable than either single contrast enemata or the serial roentgenological studies alone. They not only furnish an equivalent of the spasms, hyperperistalsis and hypermotility and anastalsis with filling defects on which the diagnosis of early ileocaecal tuberculosis is based in the serial examinations, but they manifest these equivalents earlier and more definitely. The enema studies are made with greater dispatch and less annoyance to the patient and require fewer exposures than the serial examinations.—*The Early Diagnosis of Early Ileocecal Tuberculosis, J. G. Cohen, Am. J. Roentgenol. & Rad. Ther., October, 1930, xxiv, 367—(W. I. W.)*

Ileus Resulting from Mesenteric Lymphadenitis. The author describes a case of ileus resulting from a band of adhesions between a large packet of mesenteric lymph nodes and a loop of intestines. Twenty similar cases of mesenteric-node tuberculosis associated with ileus are recorded in the literature.—*Strangulationsileus durch Lymphadenitis meseuteraica tuberculosa, K. Mischel, Centralbl. f. Chir., 1930, lvii, 865.—(H. J. C.)*

Tuberculosis of Spleen.—A case is reported of a man, twenty-two years of age, upon whom a postmortem examination following accidental death was performed. There was no disease of any organ except the spleen, which weighed nine ounces and contained whitish-yellow nodules ranging in size from a pin-head to one-quarter of an inch in diameter. Histological examination showed conglomerate tubercles with scattered giant cells and numerous epithelial cells, with commencing caseation.—*Nodular Splenic Tuberculosis with Gross Enlargement, R. H. Hodges, Brit. M. J., September, 20, 1930, no. 3637, 471.—(M. E. P.)*

Treatment of Tuberculous Abscesses.—Simply to evacuate a purulent focus of external tuberculosis is inadequate therapy. The nature of the cold abscess must be modified, because of its slow and torpid behavior, transforming it into a warm abscess by means of appropriate injections, in order that it may evolve more rapidly toward a cure. Toward this end various substances have been recommended. Those with most repute have as a basis iodine, creosote, naphthol or guiacol. Pure ether, 10 per cent zinc chloride, camphorated thymol, iodoform ether, lipiodol, chloroform-iodine solution and sodium nucleinate, express merely our poverty of resources in dealing with purulent external tuberculous foci. The substance which has perhaps the largest number of advocates is Calot's liquid. Since it was developed, however, new combinations have been recommended, one of these being the iodated chloroform solution of Marian of Bucharest. In many cases the employment of these substances has yielded encouraging results, in others none at all. It is indeed necessary to repeat the evacuating puncture ten, twelve or more times, following it by an injection, where there is an osseous or osseoarticular focus. The intervals between punctures vary from one to ten days. In general, Marian's solution yielded better and quicker results than Calot's, but neither was entirely

satisfactory. Finally it was decided to abandon all local therapy in cases in which surgical intervention could extirpate the abscess or focus without cosmetic or functional damage. Now, however, with the knowledge gleaned from Fontes's work in the "tuberculocirase" contained in tuberculous pus (a ferment which, dissolved in 0.5 per cent phenic glycerinated physiological salt solution, saponifies the fats extracted from the tubercle bacillus by xylol), a new light is shed on the pharmacodynamics of injection treatment. Amorin is now convinced of the effectiveness of suitable injections, thanks to the works of Seabra on colloidotherapy and of Fiessinger on leucocytic ferments. The extinction of the tuberculous focus is a function of bacteriolysis or else of direct destruction of the infecting agent. The work of Fiessinger, Bartel, Weycksel, Metalnikoff, and others, has shown that bacteriolysis of the tubercle bacillus, attainable *in vitro*, is accomplished *in vivo* by the combined action of two ferments secreted by the leucocytes, (1) a lipolytic one, derived from the lymphocytic series, which attacks and saponifies the liposerous carapace of the germ, and (2) a proteolytic one, derived from the secretion of the polynuclears and whose phagocytic function largely depends on it. Any substance which, injected into the interior of a tuberculous focus, sets up congestive phenomena, or an intense polynucleosis, will stimulate this second phase of bacteriolysis. The colloids in general have such effect, especially, creosote and iodine. Substances capable of developing the lymphocytic lipasogenic function favoring the first phase are fats, which explains the mode of action of certain oils. If these liquids, such as Calot's, lipiodol, etc., act by stimulating lipasogenic and proteasogenic function, there are others which may act directly, such as chloroform and ether. But this action can only be against germs contained in the pus or on the surface of the abscess wall, which are few compared to those within the tissues. The practical failure of many of these injected substances may well be due to the fact that exaggerated proteasogenesis exerts an inhibitory effect on lipolysis by inactivating the lymphocytic lipase. This may also explain the aggravating effect on tuberculosis of secondary infection. However, it seemed theoretically that chemically active electrolytes might be introduced in combination with colloidal ions and following this line of thought "colloidal cupric morrhuate," made according to Seabra, was used. Its effectiveness by hypodermic injection in pulmonary tuberculosis had already been demonstrated. The colloidal nature of this substance protects against tuberculinization by selective adsorbtion of tuberculotoxin, rendering it inactive. Its colloidal nature stimulates the proteasogenic function of the polynuclears and at the same time its free fatty acids stimulate the lipasogenic function of the lymphocytes. Moreover, both copper and codliver oil, and also calcium salts, exert specific effects of their own. Five case reports are cited, of cold abscesses complicating bone and joint tuberculosis, treated by this method. Three interesting facts stand out: *1:* The entire effectiveness of colloidal cupric morrhuate in modifying the course of tuberculous abscesses in all the cases cited. *2:* The rapidity of the results obtained compared with those by any other method. *3:* Absence of all harmful secondary effects. The reasons for its effectiveness have been cited. Especially important is the fact that it contains no chemical substance capable of preventing the bacteriolytic rôle, of the leucocytic ferments but on the contrary enhances their production. It seems to exert effects on quite distant foci from the site of injection and notably shortens the period of repair and cicatrization. In case 4, there was *restitutio ad integrum* of an essentially destructive and progressive coxalgic process in five months, about one quarter of the time ordinarily required.—*La modification des foyers purulents de la tuberculose externe, A. Amorin, Rev. d. l. Tuberc., October, 1929, x, 684.*—(*A. P.*)

Bacilluria in Surgical Tuberculosis.—Problems of great importance in tuberculosis centre about the metastasis of bacilli and the spread of the disease. Treatment of local areas of tuberculosis alone is inadequate treatment. There is no special relation between the bovine tubercle bacillus and tuberculosis of the bones and joints. In Ontario this strain is responsible for approximately 15 per cent of the surgical tuberculosis encountered. The mouth is the portal of entry for both types, through which they may be passed on to the lower respiratory or digestive tract or to the tonsils. The disease spreads by the lymphatics in step-like fashion to reach the regional lymph nodes, where it is usually checked. If not checked or if a dormant lesion is reactivated, the lymphatic system plays the important rôle of eventually carrying the infection to the blood. The transportation of an occasional bacillus to the blood-stream is more significant in the development of surgical tuberculosis than is the distribution of large numbers of bacilli. Every person suffering from tuberculosis of the bone or joint must have at least one other focus of tuberculosis in the body, for the osseous lesion is always blood-borne and secondary. The originating focus

is in the lung in most instances and in the intestine and tonsils in a few instances. The original focus is usually not conspicuous: for instance, the tonsils have been found to be diseased (histologically) in 90 per cent of a series of cases of cervical adenitis, in which the former had been removed prophylactically. The patient with surgical tuberculosis will often reveal another focus or multiple foci of haematogenous origin, the latter being inconspicuous. Renal tuberculosis is not uncommonly found associated with osseous tuberculosis (both are blood-borne infections). Careful search for tubercle bacilli in the urine of children with tuberculosis of bone has revealed interesting results. At approximately eight-week intervals during the patient's stay in the hospital, a specimen of his urine has been very carefully (aseptically) collected and the sediment examined and inoculated into guinea pigs. In some instances the patient has been under such observation for 5 years. To date, 43 adults and 67 children have been examined in this way. Of the adults, 16 (37 per cent) were found to have bacilluria, either intermittently or constantly. Of the children, 9 (13.4 per cent) showed like results. For control, similar studies were carried out on 49 patients with nonosseous tuberculosis, with the result that 4 (8.8 per cent) had bacilluria; these 4 were people exhibiting evidence of gross haematogenous spread (miliary tuberculosis or tuberculous meningitis). Not more than 5 or 10 per cent of adults with tuberculosis of bone show *clinical* involvement of the kidneys. But little is known of the preclinical or silent period of renal tuberculosis, although the clinical course of the disease is well understood. It is unlikely that tubercle bacilli are excreted in the urine by a nondiseased kidney. In all these cases, pus accompanied bacilli. Eight of these cases have subsequently been operated upon or have come to autopsy and all of them had renal tuberculosis of a degree that varied from a few small foci to large areas of caseation and cavitation. In several instances inoculation of daily specimens showed that tubercle bacilli were constantly present, while more were found in the blood which was examined at the same time. People with tuberculosis of the bone may be presumed to have tuberculosis of the kidney as well. Careful search of the urine in such patients has raised among them the former incidence of renal tuberculosis of 0.25 per cent to 13.8 per cent. It is likely that many cases of renal tuberculosis undergo spontaneous cure.—*Observations on the Pathology of Surgical Tuberculosis with Particular Reference to the Incidence of Tuberculous Bacilluria, R. I. Harris, Am. J. Surg., December, 1930, n. s. x, 514.—(H. S. W).*

Treatment of Surgical Tuberculosis.—The Work-Clinic at Leysin, Switzerland, utilizes a combination of heliotherapy and occupational therapy in the treatment of needy patients of both sexes who have surgical tuberculosis. The patients work at especially arranged machines while lying on beds on open balconies with their bodies fully exposed to the air and sunlight. Such treatment benefits the patients physically, morally, and economically. The Clinic aims to make self-maintenance possible for its patients. Photographs demonstrating the methods discussed are reproduced.—*The International Work-Clinic for Indigent Patients Suffering from Surgical Tuberculosis, A. Rollier, Brit. J. Tuberc., October, 1930, xxiv, 165.—(R. M. F.)*

Physiotherapy and Surgical Tuberculosis.—Heliotherapy, by direct exposure to the sun, is better than treatment with the various lamps. The combination of roentgenotherapy and solar radiation in surgical tuberculosis has been followed by very gratifying results.—*Traitements physiothérapiques de tuberculoses chirurgicales, M. Vignal, meeting Soc. des Chirurgiens de Paris, October 18, 1929, reported in Progrès Méd., no. 45, November 2, 1929, 1936.—(U. E. Z.)*

Blood Picture and Surgical Tuberculosis.—Markedly increased sedimentation rates, outspoken leucocytosis and shift to the left are characteristics of abscesses and suppurative changes. On the other hand, an almost normal blood picture or only slight shift to the left was found in cases in which the abscess had evacuated itself or in uncomplicated destructive bone processes, such as spinal caries without abscess-formation. In only one-third of the children examined was there a constant agreement between sedimentation and the blood picture. In initial tuberculous bone changes sedimentation was more rapid than in the later forms. The sedimentation reaction is of some value in determining the period of immobilization of a limb.—*Blutuntersuchung und chirurgische Tuberkulose, G. J. Huët, Zeitschr. f. Tuberk., 1930, lv, 423.—(H. J. C.)*

Healed Surgical Tuberculosis.—One hundred and seventy patients with tuberculous joints, treated with rigid fixation or appliances, having an average residence in an institution of three years and two months, were followed up. After at least six years from the time of discharge from the institution, 129 patients were located. One hundred and ten were in good health and capable of doing active work. Seven showed complete arrest of the disease but had poor functional results. Six had an active tubercu-

lous lesion. Five died of tuberculosis and one of "influenza."—*The After-History of Healed Surgical Tuberculosis, E. D. Telford, Brit. M. J., November 15, 1930, no. 3645, 812.*—(*M. E. P.*)

Surgical Treatment of Tuberculous Arthritis.—To introduce in these days a warning on the side of conservatism, respecting the operative treatment of osseoarticular tuberculosis, is too apt to bring down a storm of criticism, cynical contempt or to be met with complacent indifference. Under the guise of diagnostic uncertainty, without biopsy, many a joint is now treated by open operative methods which would have, by the law of chances, made a spontaneous recovery. Those who have been connected with large orthopaedic clinics have all had the experience of seeing diagnoses of tuberculous joint lesions made by the chiefs of clinic, apparatus ordered and then recovery ensue before its application. Probably as many cases of this sort present themselves now as formerly. If then, they are to be hurried to the operating table to be arthrodesed, it is likely that more than a few joints will thus be spoiled,—more than in the days of mechanical therapy. A visit to some of the larger city clinics will astound one at the number of early operations being done in children, even infants. Even the establishment of the diagnosis by biopsy does not warrant this. Methods which may be applicable or defensible under slum conditions may not be necessary in a better environment. Then, too, there is danger in entrusting these methods to injudicious hands. Operation should be reserved for cases in which conservatism has failed and the pathological process progressed. The primary consideration in treatment is encapsulation, and, if possible, annihilation of the bacilli. Next comes preservation of serviceable motion and avoidance of crippling deformity. In some joints a certain amount of deformity accompanies ankylosis. Time is a more important factor in adults than children and ankylosis is to be striven for as ensuring the best results. There is little likelihood of procuring or preserving motion in a tuberculous joint except possibly the spine; therefore, in adults operative procedures with the object of extirpation or fusion are the methods of choice. In the elbow, when extirpation can be done without destroying the mechanism controlling movement, a pathological cure is possible with preservation of controlled motion and at times this may be feasible in a measure with the hip and shoulder, practically never with the ankle and knee. At the carpus and tarsus especially favorable conditions must obtain to make partial resection advisable; if any considerable part of either has been involved amputation is generally preferable.—*The Operative Treatment of Tuberculous Arthritis, C. F. Painter, New England, J. M., October 16, 1930, cciii, 787.*—(*A. P.*)

Roentgenology of Paravertebral Abscess.—The incidence of paravertebral abscess in Pott's disease is about 80 per cent when the thoracic vertebrae are involved, but is considerably lower in other situations. It is detected clinically in about 20 per cent of all cases and in about 45 per cent in the thoracic cases. It is a very important sign in that it aids greatly in giving the diagnosis and in determining the limits of the disease. It may be the first positive sign of the disease, and sometimes it is found at autopsy when there is no gibbus and no gross deformity of the spine. Latera l views will more often reveal erosion or other pathological change in the vertebrae than will posteroanterior views in cases in which abscess first suggests Pott's disease. The shadow cast by the abscess is bilateral, spindle-shaped, has a slightly irregular margin and is better seen in the posteroanterior plate. It may displace the trachea or oesophagus and usually extends downward to the diaphragm. The shadow may be lost in the cardiac shadow. Sometimes it resembles a bilateral mediastinal effusion. Abscess associated with osteomyelitis is usually present only when signs and symptoms of bony disease are fairly obvious. Abscess of the tuberculous spine must be differentiated from several mediastinal tumors, enlarged thymus, mediastinitis, etc., and the differentiation is often very difficult. Its shape and bilateral distribution are its most important characteristics. Several case reports are given.—*Paravertebral Abscess. An Early Roentgen Sign of Tuberculous Spondylitis, L. G. Rigler, W. H. Ude and M. B. Hanson, Radiology, October, 1930, xv, 471.*—(*H. S. W.*)

Early Sign in Adult Pott's Disease.—A localized pinching of the intervertebral disc, posteriorly, is seen in the early stages of adult Pott's disease. In children, the process in its incipiency involves the entire disc. In older people, pressure is exerted for the most part on the posterior segment. In childhood the line of pressure is more vertical and consequently the entire disc is involved.—*Le mal de Pott lombo-sacré, son premier signe radiographique chez l'adulte, M. Galland, meeting Soc. de Méd. de Paris, November 8, 1929, reported in Progrès Méd., November 23, 1929, no. 48, 2071.*—(*U. E. Z.*)

Increased Growth of Bone in Tuberculous Coxitis.—Two patients are reported in whom an increased development of bone was associated with a tuberculous lesion of the hip-joints. The first patient, a girl, ten years of age, was diagnosed as having tuberculous coxitis in February, 1928. In the following fall, when she was admitted to the hospital, the thigh of the involved side was 1 cm. longer than the other; the musculature was markedly atrophied. After one year's treatment on a plaster bed and open-air regimen, the general condition was much improved, the limitation of the joint function was decreased, the musculature was normal, but a roentgenogram revealed that the head of the femur on the diseased side was much larger than the other one, and that the whole upper portion of the femur had grown beyond normal proportions. In the fall of 1930 the involved leg was 2.5 cm. longer than the normal leg. The second patient, a boy, 8 years old, showed an essentially similar development. The difference in length between the two legs is 2 cm. Both cases never showed bone lesions. Similar observations are well known, especially in the case of gonitis. In all cases showing increased growth the absence of definitely destructive bony foci was noted, some of them were purely sinovial lesions.—*Pathologische Wachstumssteigerung des Hüftgelenks bei Coxitis Tuberculosa, S. Bornstein, Klin. Wchnschr., February 14, 1931, x, 314.*—(*M. P.*)

End-Results in Hip-Joint Tuberculosis.—This study was undertaken for the purpose of arriving at a correct estimate of the outcome of treatment carried out by the orthopaedic staff of the Boston Children's Hospital during the ten years 1915 to 1924 inclusive. It was believed that periodical surveys of results, with perhaps a comparison of those obtained in other clinics with other methods, offered the best criteria for determining the value of the therapy employed. All cases classified on the card catalogue as hip-joint tuberculosis were considered, numbering 189, although 54 were later definitely found not to have tuberculosis. The reasons for this large number of erroneous diagnoses were: *1:* The rule of the Children's Hospital Clinic, adopted for very good reasons, that on the first visit of the patient to the clinic a tentative diagnosis must be made. *2:* Impracticability of keeping a catalogue of proved diagnoses because the time when these are made can not be predicted. *3:* Relative inexperience of the house officers who often make the tentative diagnosis. However, when doubt exists such a diagnosis is usually made because it automatically places the patient on the preferred list for admission for diagnostic study and treatment. *Nontuberculous Series:* Out of 54 patients definitely found not to have tuberculosis of the hip, the end-result was determined in 48. Of these, 22 were finally diagnosed as toxic arthritis, clearing up promptly on treatment of the cause, usually either a pharyngeal infection or marked constipation. All these roentgenographs were negative. Fifteen were examined and found to have normal motion and contour. Most of them required but a few week's treatment and some cleared up immediately following efficient catharsis or irrigations of the bowel. Six cases were finally, largely on the basis of roentgenographs, diagnosed as Legg's disease. Four cases of septic hip joint were treated by the Ober method of incision and drainage. Other diagnoses were epiphysitis, iliac abscess, psoas abscess and osteomyelitis. Only one case of the whole nontuberculous series showed deformity, while 58 of 67 tuberculous had measurable flexion deformity. *Tuberculous Series:* As before stated, when a tentative diagnosis of tuberculosis of the hip was made, the case was placed on the preferred list for admission to the ward and if he could not be admitted at once a long plaster spica was applied. On admission, traction was applied in line with the deformity and maintained until sensitiveness, muscle spasm and deformity subsided. Meanwhile all laboratory procedures, including roentgenographs of hips and lungs and intracutaneous tuberculin test, were carried out. Then a Bradford abduction hip splint was applied with traction, the patients got up on crutches and sent either to their homes, if suitable, or to the Convalescent Home of the Children's Hospital. These cases were observed once a week by the senior member of the resident staff and the others seen in the clinic at intervals of two to six weeks. Cases showing persistent flexion deformity had a plaster of Paris spica applied as well as the Bradford frame. The final diagnosis was made after consideration of the family history, the personal history, the physical examination, clinical course, laboratory data and roentgenographs. Occasionally microscopic examination of tissue obtained at biopsy, or guinea-pig inoculation of joint fluid or tissue was done. *Results in Tuberculous Cases:* There were 135 such in the series, after deducting those shown to be due to other causes, of whom 21, over 15 per cent, were found to have died, 9 of these of tuberculous meningitis and 4 of generalized tuberculosis. Of 114 remaining, 47 could not be examined and attempts to determine their results by sending blanks to the family physician failed because of the apparent lack of ability of the average physician to conduct a

joint examination. Of the 67 living and examined, 18 were still under treatment and their disease classified as active. However, in some the end-results could be judged. The results for the group may be summarized: Twenty had bony ankylosis, 31 fibrous. Forty-six, including those with bony ankylosis, had slight or no motion, 8 less than 10 degrees of motion in flexion, one 30 degrees and one 40 degrees, one 75 degrees, one 80 degrees and one 90 degrees. Fifty-eight patients, or 86 per cent, showed some flexion deformity, but only 15, or 22 per cent, adduction deformity, and 21, or 31 per cent, abduction deformity. Thirty of the patients with flexion deformity, or 52.4 per cent, had less than 30 degrees motion, and all but 4, or 93.8 per cent, less than 50 degrees. These results may be regarded as quite good. The impression was also gained that those with the most deformity did not necessarily have the most awkward gait. It seems that the condition of the lumbar spine is important in this matter of gait. Of 59 patients examined for degree of motion, 46 or 80 per cent had little or none, while 13.5 per cent had 10 degrees or less. It must be remembered that the first object sought is control of the disease, which is readily attained under the treatment outlined. Cure with motion must at present be regarded as a hope rather than an accomplishment and permanent arrest of the disease seems incompatible with useful motion. Ankylosis by bone-formation is sought but fibrous ankylosis is fairly satisfactory. Less than 10 degrees motion is believed to be consistent with a good result.—*Tuberculosis of the Hip Joint, D. S. O'Connor, New England J. M., September 25, 1930, cciii, 636.*—(*A. P.*)

Lengthening of Lower Extremities in Tuberculosis of Knee Joint.—In tuberculous gonitis there was found a definite lengthening of the lower extremities. In 15 cases it consisted of an increase of 2 cm., in 13 of from 2 to 4 cm. and in three of from 4 to 5 cm. All the cases were in children under 15 years of age, who had been kept in extension for a considerable time. A girl, 20 years of age, had no lengthening. The main increase in length involved the diaphysis of the femur, which proved to be the bone that lengthened most. The extension bandages were only slightly responsible for the lengthening, as shown by a case of coxitis in which a greater amount of extension resulted in a much smaller increase in length. It is believed that the diffusion of a toxic substance from a tuberculous focus may be the irritating influence stimulating increased length.—*Die Verlängerung der untersten Extremität bei tuberkulöser Gonitis, D. v. Dorp-Beucker-Andreae, Zeitschr. f. Tuberk., 1930, lv, 419.*—(*H. J. C.*)

Tuberculosis of Urinary Tract.—The total incidence of genitourinary tuberculosis is about 2 per cent; of this, only about 0.5 per cent is genital. Of 135 cases of congenital tuberculosis, 84 presented disease of the urinary apparatus alone and 24 of the genital apparatus alone. One hundred and one cases of urinary tuberculosis have been studied. Among these, renal disease predominated, irrespective of sex and was most frequently seen in the third, fourth and fifth decades. It was much more frequent in males (4 to 1). Bilaterality was common, but this comes late in the course of the disease. The infection may be ascending as well as haematogenous. It may appear pathologically as nephritis, miliary tuberculosis, ulcerative papillitis (being the type in which haematuria is especially common), pyelitis (probably an ascending infection through lymphatics), the very frequently encountered caseocavernous tuberculosis, and pyonephrosis. Symptomatically the affection may present itself with the following: Frequency of urination, dysuria, pyuria or haematuria especially diurnal, vague dull or dragging lumbar pain and loss of weight. Pus in urine in which pyogenic bacteria cannot be detected is a strong indication of tuberculosis, even in the absence of detectable tubercle bacilli. Tubercle bacilli may be eliminated in the urine without evidence of renal tuberculosis and tubercle bacilli in the urine is not sufficient evidence *in itself* for the diagnosis. This demonstration is very important, but it must be taken along with a careful physical examination of the genitalia, chromocystography, pyelography, bilateral catheterization, differential renal-function test and exploratory lumbar incision. Prognosis depends upon removal of the diseased organ and is definitely lessened by watchful waiting.—*Tuberculosis of the Urinary Tract, B. A. Thomas, Am. J. Surg., November, 1930, n. s. x, 308.*—(*H. S. W.*)

Genital Tuberculosis.—It is very difficult to determine whether prostatic or epididymeal tuberculosis develops first in cases with disease in both situations. Evidence gleaned from experience with children who have epididymeal tuberculosis indicates that the internal genitalia escape the disease in all but a very small percentage of cases. Cases of tuberculosis of the epididymis may exist for years with no involvement of the prostate. Diagnosis of tuberculosis of the epididymis is usually not difficult: "induration, enlargement and nodularity of the organ, involving especially the lower pole, with

but insignificant pain or tenderness" and a sinus track, healed or active, are the chief criteria. The latter is the most important single sign. If serious doubt exists as between tuberculosis and a malignant growth, excision under local anaesthesia is indicated. Radical removal of the genital tract for genital tuberculosis has been practised, but is to be warned against, in general. Observation of more than 500 cases over a period of 20 years has convinced the author of the safety, saneness and efficiency of the less radical operative procedure of epididymectomy. Of 113 of these cases, from one to 25 years after operation, 27 per cent died from some form of tuberuulosis; 85 per cent of the deaths took place within six years of the operation (1.5 per cent being operative deaths). In a large number of these patients, examination made sometimes years after operation revealed disappearance or diminution in the nodulation and other signs originally present. In but two cases did the disease develop in the prostate. Of 125 cases which received no surgical treatment at all, 33 per cent were alive from five to 17 years after examination; 30 per cent died from some form of tuberculosis, which is "an incidence one-third greater than in those in the other group" (which did receive surgical treatment). The type of operation in performing epididymectomy is important. It removes the vas from 2 to 5 cm. above the internal ring and is described in the literature. It has been demonstrated that the testis with a considerable amount of tuberculosis may heal. Excision of 1 cm. of the vas on the other side is a good prophylactic manoeuvre. Patients with genital tuberculosis also have tuberculosis elsewhere in the body and should be treated just as the sanatorium patient is treated. Heliotherapy is probably helpful; tuberculin surely is, particularly as an adjunct after operation.—*Diagnosis and Treatment of Tuberculosis of the Genital Tract, J. D. Barney, J. L. Watson and S. Elliott, Am. J. Surg., October, 1930, n. s. x, 84.*—(*H. S. W.*)

Treatment of Male Genital Tuberculosis.—About every twentieth patient with urogenital complaints has tuberculosis of the urogenital tract. The first clinically recognizable sign is usually an inflammation of the testis or epididymis. This is frequently preceded, and clinically not noticed, by a tuberculous focus in the respiratory tract. The prognosis of tuberculosis in the urogenital tract without treatment is grave. Destructive processes develop throughout the tract, cold abscesses will form, perforate the skin and become secondarily infected. More than one-third of patients with tuberculosis of the genital tract die of tuberculous meningitis. The best therapy for tuberculous infection of the epididymis is radical removal. Conservative treatment is indicated only in cases in which epididymis, testes, seminal vesicles and prostate are involved. Any form of local therapy has not yielded results. Tuberculin therapy was found to be ineffective. Roentgen therapy is not advised. In tuberculosis of the prostate and the seminal vesicles, radical surgery is indicated, especially when destructive processes have occurred.—*Behandlung der männlichen Genitaltuberkulose, V. Blum, Wien. klin. Wchnschr., October 23, 1930, xliii, 1320.*—(*M. P.*)

Treatment of Female Genital Tuberculosis.—The main difficulty in evaluating therapy in tuberculosis of the genital tract in women is the uncertainty of the diagnosis. It is hardly ever possible to make a definite diagnosis without exploratory operation, and even the macroscopic appearance is not always diagnostic. In some cases the diagnosis must be confirmed by histological and bacteriological examinations of excised tissue. Tuberculous lesions in the genital tract are not infrequently found incidentally during operations for tumors or some other diseases. It is probably due to the difficulty and uncertainty of the diagnosis that the treatment has undergone such marked changes during the last forty years. The active surgical therapy which was advocated by Hegar has been abandoned by many gynaecologists. Partial resections are usually not successful because genital lesions are usually secondary; but as mentioned above operation is usually necessary to ascertain the diagnosis. General treatment is of importance. In addition, roentgen therapy is recommended as the treatment of choice. Radiation should be given in series of three treatments, each time about 10 per cent of the skin-erythema dose, at intervals of two to three months. The dosage should be kept small enough not to suppress menstruation. Injury to the germinal cells need not be feared since pregnancy after genital tuberculosis does not occur.—*Behandlung der Genitaltuberkulose des Weibes, F. Kermauner, Wien. klin. Wchnschr., October 9, 1930, xliii, 1245.*—(*M. P.*)

Tuberculous Salpingitis.—Tuberculous salpingitis occurs more frequently than is generally thought. But it is strange that it seldom involves the ovaries. The disease must be regarded as clinically secondary to tuberculous foci elsewhere in the body. Numerous other diseases of the Fallopian tubes are much more common than this one and the differential diagnosis of the latter is very

important. The diagnosis is difficult, the onset is insidious, and the progress slow; there is lower abdominal pain, menstrual disturbance and malaise, loss of weight, etc.; the affection is usually bilateral and the tubes may be considerably enlarged; vaginal smears will reveal acid-fast bacilli occasionally, but these may be smegma bacilli; X-ray of the chest may aid; palpation of nodules in the tubes is a leading sign; a careful history is essential. In the early stages, medical care may lead to cure. Radical surgical removal curvs permanently about two-thirds of the cases. A case with great tumefaction is reported. It simulated an ovarian cyst.—*Tuberculous Salpingitis: Report of Case with Unusual Symptoms in Which Extremely Large Inflammatory Mass Simulated an Ovarian Cyst, A. Stein, Am. J. Surg., November, 1930, n. s. x, 331.*—(*H. S. W.*)

Addison's Disease.—About 90 per cent of all cases of Addison's disease depend on nearly complete destruction of the suprarenal glands, both cortex and medulla, by tuberculosis. Such cases give no indication of the respective rôles played by the cortex and by the medulla. Approximately 10 per cent of the cases exhibit a marked decrease in the size of both suprarenals, which are usually affected about alike, and this "atrophy" is found to depend on an extensive, sometimes an almost complete destruction of the epithelium of the cortex, with less or practically no destruction of the medullary tissues. No cases of undoubted Addison's disease seem to have been observed in which the medulla was found to be destroyed while the cortex was for the most part intact, although cases of such selective medullary destruction without the picture of Addison's disease have been observed. The dependence of Addison's disease predominantly on destruction of the cortex of the suprarenal glands seems, therefore, to be well established by cases in which this condition is present. Six typical examples are described in this paper. The cause of the selective destruction of the suprarenal cortex without recognizable corresponding damage to any other tissue in the body is entirely unknown. The bilateral character of the lesion indicates its haematogenous origin. It is not associated with vascular lesions or occlusions. The resemblance both of the tissue damage and the regenerative changes in the surviving cortical epithelium to the processes seen in diffuse toxic necrosis of the liver ("acute yellow atrophy") suggests that the suprarenal condition also is the result of a toxic necrosis by some poison selectively injuring the epithelium of the suprarenal cortex. The histories of the cases so far reported, however, give no satisfactory clue as to the source of nature of the hypothetical poison. About the only other anatomical change found outside the suprarenal glands is a marked infiltration of the thyroid gland by lymphoid cells, which often form large lymph follicles with germinal centres, replacing much of the glandular tissue. This occurs in the absence of a status thymicolymphaticus, and in two of these cases not even microscopic residues of the thymus could be found. Although lymphoid infiltration of the thyroid gland has been observed in Addison's disease due to tuberculosis of the suprarenal gland, it seems to be less marked and less frequent than in the cases associated with selective destruction of the suprarenal cortex.—*Addison's Disease With Selective Destruction of the Suprarenal Cortex* ("*Suprarenal Cortex Atrophy*"), *H. G. Wells, Arch. Path., October, 1930, x, 499.*—(*R. M. F.*)

Addison's Disease.—Pigmentation, the most characteristic feature of the disease, is unreliable for diagnosis because it is often absent and also occurs in many other conditions, which are described. Since tuberculosis of the suprarenals is the commonest causative lesion, evidence of tuberculosis may be found elsewhere, especially in the lungs. A typical case is reported in detail. Roentgenograms, which are reproduced, disclosed extensive tuberculosis in both lungs and shadows interpreted as calcification of the suprarenals, lying on each side of the first lumbar vertebra. Treatment, which was palliative, and specific in that suprarenal gland was given, was of no avail and the patient died. Necropsy was not obtained. In 1914 Boyd and Rolleston described the only other case showing calcification of the suprarenals found in the literature. *Conclusions:* X-ray examination of the suprarenal glands is necessary in all cases of Addison's disease. Positive findings will be obtained only when there are calcareous deposits. The author has seen two cases of Addison's disease in which X-ray examination was negative and necropsy disclosed simple atrophy of the suprarenal glands.—*Addison's Disease: the Value of Radiography in Direct Diagnosis, T. Thompson, Lancet, October 11, 1930, ccxix, 785.*—(*R. M. F.*)

Rare Case of Cerebral Tuberculosis.—The author reports a case of tuberculosis in a 12-year-old boy, initiated by a trauma to the head and resulting in symptoms of meningitis. The boy exhibited a positive Pirquet reaction and a hilum tuberculosis roentgenologically. The meningitis cleared completely after 2 months, but upon roent-

genological examination there was the shadow of a calcified tuberculous focus in the right ventricle. The question of whether this was a meningitis or a solitary tubercle is discussed and the literature reviewed.—*Über einen seltenen Fall von Gehirntuberkulose, E. Gorter, Zeitschr. f. Tuberk., 1930, lv, 414.*—(*H. J. C.*)

Tuberculosis of Skin.—The proof of haematogenous spread from a vascular focus of tuberculosis to the skin is very often impossible. On the other hand, primary cutaneous tuberculosis, with the enlargement of the regional lymph nodes, is to be attributed to exogenous infection. It is difficult to differentiate between a haematogenous or exogenous reinfection and exogenous primary infection. In cutaneous tuberculosis one should seek pulmonary changes roentgenologically, especially apical affections, solitary tubercles, fine granulation and clouding of pulmonary lymph nodes. One should also look for general lymph-node involvement. Of 56 cases of lupus, 46 per cent showed changes in the hilum in the form of mediastinal lymph nodes or calcareous shadows. Of 2 cases of lupus which came to autopsy (accidentally associated with carcinoma), one showed no signs of pulmonary tuberculosis, but had a calcified mesenteric lymph node which contained many tubercle bacilli. The other revealed a calcified pleural focus, multiple small calcifications and scars which when inoculated into animals produced tuberculosis.—*Zur Frage der Chronizität der Hauttuberkulosen, insbesondere des Lupus vulgaris, O. Dittrich, Deutsche med. Wchnschr,. June 13, 1930, lvi, 992.*—(*H. S. W.*)

Light Treatment of Lupus.—The treatment of lupus is notoriously unsatisfactory. The use of acid-nitrate of mercury is invaluable, particularly in cases with roots deep into the skin. Ultraviolet light from either the Kromayer or the Finsen water-cooled lamp is efficacious if it is applied directly, with the lamp pressed against the lesion. The mere shining of ultraviolet light on the area is of no avail. Pressure (with the Kromayer lamp) should be sufficient to render the tissue bloodless and should be continued for 10 or 15 minutes, depending upon the depth of the disease. The treated area is then dressed with boric ointment and let alone until blister and ulceration take place, which may be a month or longer. The treatment with the Finsen lamp requires from one to two hours. Scars are smooth and not unsightly. New areas may be treated before ulceration of former sites of treatment has developed. An extensive case of facial lupus may require weekly treatments for two years or longer. Patients are quick to realize the benefit from the treatment and they coöperate readily. The use of heavy doses of general ultraviolet light is an excellent adjuvant to the care of lupus and is sometimes curative in itself. With coöperative patients, lupus can be cured in 95 per cent of cases. For general exposures, carbon-arc lamps are better. Patients are started with 30-minute exposures at a distance of three feet, the maximum exposure being two to three hours daily. Those who have very extensive disease with great destruction of tissue, artificial noses and other "tissues" are necessary and are supplied the patient as a part of his treatment. There is no evidence that light causes exacerbations of visceral tuberculosis.—*Light in the Treatment of Lupus, W. J. O'Donovan, Brit. J. Actinotherap. & Physiotherap., May, 1930, v, 26.*—(*H. S. W.*)

Radiotherapy in Tuberculosis of Skin.—Radiotherapy is a very important factor in the treatment of the various forms of cutaneous tuberculosis. Various types of radiation, such as heliotherapy, ultraviolet radiation, X-rays and Grenz-rays should be used and selected to answer the individual needs. Both local and general radiation may be used. Any form of radiation therapy should be supplemented with other therapeutic agents, such as specific therapy, surgical, physical, chemical and dietetic treatments.—*Strahlenbehandlung der Hauttuberkulose, H. Fuhs, Wien. klin. Wchnschr., October 16, 1930, xliii, 1287.*—(*M. P.*)

Poor Results with Gerson Diet in Lupus.—In two cases of lupus there was a definite progression of the condition following the restricted use of salt and in spite of increased weight during the dietary regimen in both cases. In one case the progression of the disease began shortly following the institution of the salt-poor dietary regimen. It is therefore concluded that this diet is not to be considered a universally good method against tuberculosis.—*Verschlimmerung von Haut- und Schleimhauttuberkulose durch Gerson-Diät, P. Wichmann, Beitr. z. Klin. d. Tuberk., 1930, lxxiii, 825.*—(*H. J. C.*)

Dietary Treatment of Lupus Vulgaris.—A diet is recommended of uncooked and salt-free food, containing a small quantity of meat, but consisting mainly of fruit, vegetables, eggs, milk, and butter. Three hundred and forty-one patients suffering from lupus vulgaris have been treated in this manner and furnish convincing evidence that

this disease may be cured by means of diet.—*The Dietetic Treatment of Lupus Vulgaris, H. Haldin-Davis, Brit. M. J., September 27, 1930, no. 3638, 539.*—(*M. E. P.*)

Gerson's Diet in Lupus.—This is a review of the extensive literature on this subject. The author's experiences with this dietary regimen extend over too brief a time for a final judgment. The general conclusion is reached that Gerson's diet in the modification suggested by Herrmannsdorfer brings about striking improvement in tuberculosis of the skin, but that its influence on tuberculosis of internal organs and particularly of the lung is questionable.—*Therapie des Lupus vulgaris und die Gerson-Diät, R. Volk, Wien. klin. Wchnschr., November 27, 1930, xliii, 1461.*—(*M. P.*)

Treatment of Pulmonary Tuberculosis.—Treatment is required when a tuberculous lesion is active. Unnecessary treatment may readily make an invalid of an individual who is out of sorts through some other cause. The proportion of individuals reacting positively to tuberculin increases from infancy to puberty. The great majority are not clinically affected and keep well without treatment. The body provides a certain degree of resistance to tuberculosis, and this is enhanced by slight infections. It is not, however, comparable to the immunity produced by vaccination against smallpox. Patients who have had a mild tuberculous lesion are more liable to disease than are others. Monkeys in captivity are prone to develop tuberculosis. Decrease of disease in these animals followed better ventilation, housing conditions, and light when the use of *BCG* failed to protect. An attempt to prevent the occurrence of tuberculosis by the use of tuberculin or tubercle bacilli seems wrong. Emphasis should rather be placed on preventing infection as far as possible, and on improving housing conditions. In early suspected cases for which treatment is most important, the symptoms are variable. Most important are cough, sputum, fever, nightsweats, haemoptysis, and pleurisy. Physical examination should be done, but undue faith should not be placed in physical signs. An X-ray is all important but demands intelligent interpretation. Hence shadows at the hilum should not be mistaken for disease of the lung. As to special tests, a negative tuberculin reaction (except in moribund patients), will exclude tuberculosis. Other tests may be of some aid during treatment but contribute nothing to diagnosis. In the chronic case the outstanding requirement is the leading of a wise restful life. A loss of weight soon after leaving the sanatorium is to be expected. Undue fatigue or an evening rise of temperature suggest activity. Haemoptysis or pleurisy may demand treatment for a short time. Any definite increase in the lesion as detected by physical signs or the X-ray is an indication that treatment is required. Finally it should be remembered that an idle life is not a healthy one and that many a patient will live longer if he thinks less of his own health and settles down to some suitable occupation. Writing in the *Lancet*, December 20, 1930, James J. Connolly questions the author's conclusion that reliance should be placed on eliminating infection rather than on the use of some method to produce immunity. He believes that the resistance acquired is of the same order as the immunity acquired toward other diseases. He points out that not a single child born in Papworth Village has ever shown signs of tuberculosis, although opportunities for juvenile infection must be extensive.—*Indications for Treatment in Pulmonary Tuberculosis, L. S. T. Burrell, Lancet, November 22, 1930, ccxix, 1109.*—(*R. D.*)

Indications for Treatment in Pulmonary Tuberculosis.—Tuberculin demonstrates infection in a large proportion of individuals, yet only a few develop clinical tuberculosis. Active tuberculosis is amenable to treatment in the early stages. However, a prolonged holiday will not necessarily prevent further development of tuberculosis, and the patient may be better following his usual occupation under medical supervision. Resistance apparently develops from infection. Failure to react to tuberculin is no indication for treatment. Any attempt to protect by tuberculin or tubercle bacilli seems to be wrong. The policy that appeals to most workers is to prevent infection or to dilute it as far as possible by sanitation, cleanliness and correction of overcrowding. Clinical signs indicate activity of a lesion. In the absence of definite evidence of tuberculosis, the patient should be kept under observation only. If there is definite evidence, treatment should be started at once. The main function of a sanatorium is to restore to complete health those who have not yet passed into the incurable stage of tuberculosis.—*Indications for Treatment in Pulmonary Tuberculosis, L. S. T. Burrell, Brit. M. J., November 22, 1930, no. 3646, 878.*—(*M. E. P.*)

Sanatorium Treatment.—In an attempt to evaluate the sanatorium treatment of tuberculosis, the condition of 149 patients treated at a dispensary was determined. The results agree in general with

other published findings, particularly as to survival rates. Advanced cases may derive temporary benefit and leave a sanatorium with a gain in weight and temporary restoration of working power. But the majority succumb within a year or two. Fifty to 60 per cent taken in the early stages are capable of working from four to five years after leaving the sanatorium. The most hopeful results can be expected only in the early cases. However, the value of sanatorium treatment is not to be judged solely by the survival time of the patient. The prevention of the spread of infection, the patient's comfort, the lessening of the strain of nursing for relatives of the patient, and instruction in proper modes of living are valuable advantages. Regarding the hereditary influence in tuberculosis, it probably consists only in the inheritance of a predisposition or a lack of immunity, to tuberculous infection.—*Findings in Five Years' Work on Tuberculosis, J. A. Struthers, Tubercle, November, 1930, xii, 62.*—(*M. E. P.*)

Admission to Sanatoria.—Treatment in a sanatorium is generally held to offer the optimum for the tuberculosis patient. Yet few enter upon this treatment until their disease has made considerable progress. With a view to learning more about the factors responsible for this delay, the National Tuberculosis Association undertook a study of what happens to patients prior to their admission. The histories on which this study is based concern 1499 patients. *Time Elapsing between Appearance of First Symptom and Sanatorium Admission:* After a few days more than twelve months had elapsed since the first symptom appeared, just half of these patients had been placed under sanatorium treatment. Within six months, 411, or 27.4 per cent, had been admitted, and 6 more prior to any symptoms. Of those admitted within six months, 14.6 per cent were in the minimal stage, 51 per cent in the moderately advanced, and 34.5 per cent in the far advanced. That such a high percentage of those admitted within six months after the initial symptoms should be in the more advanced stages of phthisis confirms the opinion previously expressed that "There is a vast amount of concealed tuberculosis which frequently does not become evident until there has been considerable involvement of the lung." *Time Elapsing between First Physician's Consultation and Admission:* In a previous article it was stated that 24 per cent of the 1499 patients permitted a year or more to elapse after the appearance of the first symptom before consulting a physician. This means that to the patients themselves may be attributed a considerable share of the delay. But the physician also plays a part in the situation. So far as the patients themselves are concerned, something less than six months from the first consultation brought half of them into the sanatorium (54.4) per cent were admitted within six months). Within a year 72 per cent were admitted. Of those who entered within three months after first consulting a physician, only 13.2 per cent were in the minimal stage when admitted, 47.2 per cent were moderately advanced, and 39.5 per cent far advanced. *Time Elapsing between Physician's Diagnosis and Patient's Learning of It:* Nearly three-fifths of the patients, 59 per cent, thought the physician had informed them the very day he made the diagnosis of pulmonary tuberculosis, while an additional 28 per cent were told within a month. On the other hand, 33 patients were sure a diagnosis had been made a year or more before they were informed. According to their own statements, this delay in many instances adversely affected their chances for recovery. *Time Elapsing between Diagnosis and Sanatorium Admission:* Half of the patients entered a sanatorium within a little over two months after the diagnosis. For some reason the men gained admission more promptly than the women, 55 per cent of the former being in a sanatorium within two months of the diagnosis and but 42 per cent of the latter; 80 per cent of the men were in by six months and 71 per cent of the women. *Time Elapsing between Diagnosis and Recommendation of Sanatorium Treatment:* Most of the patients were promptly advised, 42 even before a definite diagnosis was made, and 68 per cent within a month. Again, 72 per cent of the men had sanatorium treatment recommended within a month, against 64 per cent of the women. Of all those not advised to enter a sanatorium for a year or more and those entering on their own initiative, the great majority were admitted in the far advanced stage. *Person First Recommending Sanatorium Treatment and First Apprising Patient of his Tuberculosis:* In 1063 of the 1499 cases the advice to enter a sanatorium originated with the consultant who told the patient of his disease. In 118 cases the suggestion came from a physician previously consulted, of whom over half were general practictioners. In 31 cases the suggestion came from clinics, especially those maintained by the employers. But in 215 cases the advice came from a consultant seen subsequently to the one who informed the patient of his disease. In 98 instances the suggestion emanated from a layman, or the patient himself. It appears that the general practitioner is the most hesitant to suggest sanatorium treatment,

although to 778, or 52 per cent of the patients. the counsel to enter a sanatorium came from a general practitioner,—in 650 from the one who told the patient he was tuberculous. Yet in 907 instances such a general practitioner was the first to break the news of his having tuberculosis to the patient, and about 1300 patients were seen at some time prior to their admission by one or more general practitioners. In contrast, only 148 patients were apprised of their tuberculosis by a chest specialist, yet 220 first received sanatorium recommendations from such; also, 164 learned of their disease from a tuberculosis clinic, and 216 were advised by such clinics to enter sanatoria. There are, no doubt, reasons for the hesitancy of the general practitioner to recommend sanatorium treatment He may not like the character of the sanatoria in his neighborhood. In many cases these assume more the character of charitable institutions than hospitals for treating disease and there may not be one within hundreds of miles to which a physician would want to refer a patient of moderate means. Not knowing of a sanatorium of the proper kind nor being able to refer the patient to such, the physician simply does not advise sanatorium treatment. Obviously each general practitioner should know the names and addresses of suitable sanatoria for his patients. He should also know something of the personalities in charge and of the general environment. But many physicians do not know how to acquire this information without great effort. Here is an opportunity for sanatorium superintendents to make both themselves and their institutions better known throughout the territory they serve. Undoubtedly the fact that the general practitioner, through want of familiarity with symptoms or lack of readily available diagnostic facilities, is less apt to make a diagnosis of tuberculosis than a consultant specialist, combined with his greater hesitancy to urge his patient to place himself under sanatorium care, tends to lessen the patient's opportunity for recovery. *Time Elapsing between Sanatorium Recommendation and Gaining Admission:* Of the whole group of patients, 22 sought admission without being advised, 2 before being advised, and 1174 within one month after such advice. Thus, while the patient may be blamed for not seeking medical advice earlier, little reproach can attach to him because of failure to seek sanatorium treatment once it has been advised. About one-seventh of the women and one-eighth of the men waited anywhere from two months to over a year before asking admission. Of those waiting so long, the percentage of far advanced cases was one-fifth greater than for the group as a whole. *Time Elapsing between Sanatorium Application and Admission:* Over this particular interval, except in rare instances, neither patient nor physician has control. Of the 1499 patients on whose histories this study was based, 862, or 58 per cent, were admitted to a sanatorium within a month after their original application, and an additional 27 per cent within the next two months. But 15 per cent had to wait three months or more. Women encountered more difficulty than men in gaining sanatorium admission, only 50 per cent being admitted within a month, as against 65 per cent of the men. The outstanding reason for delay was a lack of beds, and, of 634 patients who waited a month or more, 482 gave this as the sole cause. It was also the chief cause in 94 other cases. Among other causes recorded as responsible were residence requirements (in 11 or more), too advanced disease, and inability to travel because of serious condition. Financial considerations also entered into the question with 80 patients, of whom 56 lived in a state with inadequate sanatorium facilities, so that 39 per cent of the patients who had been admitted there and were included in this study were obliged to wait three months or longer. Had they possessed funds to pay for their care in a near by private establishment, proper treatment would have been initiated much earlier. *Financial Status of Patients:* Of the 1499 patients under discussion, 135 were in private sanatoria operated for profit and 113 in private sanatoria established for the benefit of corporation employees. Of the remaining 1251, only 118 paid all that might be expected of them by the institution, 216 paid part cost, 28 were referred to as private cases, and in 886 treatment was without expense to the patient. More women paid than men, which is not surprising, as they might be expected to leave wage-earners at home. Since adequate treatment for tuberculosis extends over a long time and requires a considerable expenditure of money, patients who have slight or no reserve funds cannot afford to pay for such care. This study makes it strikingly clear that, in spite of the general decline in tuberculosis mortality, there exists a very real need for additional beds in public sanatoria. Associated with this delay between application and admission is the lack of any sort of treatment in the interim which was the lot of a large number of patients (about 30 per cent). Clinics and private physicians were both culpable. Evidently many physicians do not give consideration to the fact that tuberculosis frequently progresses very rapidly and that, whether it does or no, rest in bed at home facilitates improvement. *Summary:* The question as to

how much time passes before a patient is admitted to a sanatorium embraces a number of others. In this study based upon 1499 special histories it was found that: *1:* Twelve months and a few days had elapsed after the appearance of the first symptom of tuberculosis before half the patients had been placed under sanatorium treatment. *2:* Of the cases admitted within six months, 51 per cent were in the moderately advanced and 34.5 per cent in the far advanced stage. *3:* Within six months after the first consultation with a physician, 54.4 per cent of the patients were under sanatorium care. *4:* Only 59 per cent of the group thought the physician had told them at the time he made the diagnosis of pulmonary tuberculosis. An additional 28 per cent were told within a month. *5:* Half of the patients entered a sanatorium within two months after such diagnosis. *6:* Seventy-one per cent were told they should enter a sanatorium either before or within a month after a diagnosis was first thought to have been made. Of those not advised to enter a sanatorium for a year or more after the diagnosis, most were in the far-advanced stage when admitted. *7:* Sanatorium treatment was first suggested by the physician who first told the patient of his disease in 71 per cent of the cases; by one consulted previously in 8 per cent, subsequently in 14 per cent, and by a layman or the patient himself in 7 per cent. *8:* Relatively more of the patients who first learned of their disease from a general practitioner were in the far-advanced stage on admission than of those who learned of it from special consultants. *9:* Four-fifths of the patients made efforts to gain admission to a sanatorium in less than a month after such recommendation. *10:* Fifty-eight per cent of these patients were admitted within a month of their first application. But 15 per cent had to wait three months or more. *11:* The outstanding reason why so many patients failed to enter sanatoria reasonably promptly was an inadequate number of beds. Next most important was the financial status. *12:* Seventy-one per cent of the patients in public sanatoria were receiving treatment without any expense to themselves. *13:* About 30 per cent received no treatment between the advice to enter a sanatorium and admission.—*The Loss of Time before a Tuberculous Patient Is Admitted to a Sanatorium, L. R. Williams and A. M. Hill, New England J. M., November 13, 1930, cciii, 961.*—(*A. P.*)

Tuberculosis Settlements.—In the care of tuberculosis patients following sanatorium treatment, a system of industry based upon its suitability to the individual is advocated by the Tuberculosis Settlement. The occupational method of treatment is utilized as the preliminary stage of training. Suitable hours of work, lack of competition and strain, with constant medical supervision, are emphasized. The experiences at Papworth, Preston and Barrowmore Halls have shown that these settlements have a valuable place in any scheme devoted to the management of tuberculosis patients. At Barrowmore Hall the total time of settlement of the men amounts to ninety-three years and the total period of sickness from tuberculosis is two years. The industries include woodwork, upholstery, boot-repairing, decorating, poultry-raising, gardening and clerical work. Settlements should be extended from existing sanatoria and the question of suitable markets and trades carefully studied. The sanatorium must be the controlling authority of the whole settlement because the scheme is primarily a medical one.—*Economics of Tuberculosis Settlements, E. L. Sandiland, Tubercle, November, 1930, xii, 49.*—(*M. E. P.*)

After-Care in Tuberculosis.—The problem of the care of tuberculosis patients discharged from sanatoria in Great Britain is discussed. Expensive propaganda designed to tell those patients how to live is a waste of money unless the sufferers are enabled to follow the advice given. Sanatoria are useless for permanently arresting the disease except in early cases, unless coupled with village settlements. Employers will not hire consumptives as long as fit men are available. Early cases will remain the exception and not the rule until the economic fear is removed. The falling tuberculosis death-rate is due, not entirely to medical efforts, but to the general improvement in the national standard of living. Availability of village settlements serves to remove the patient's fear of economic disaster, and, once removed, earlier diagnosis would suffice to reduce the 40 per cent of sanatorium discharges requiring permanent settlement to nearer 20 per cent, and the remainder, having received treatment early, would be fitted to resume work as economic units in the outside world. No village settlement should limit its benefits to any special class of people. Villages provide pleasant environment for cases with permanently damaged lungs.—*The Economics of After-Care in Tuberculosis, P. C. Varrier-Jones, Brit. J. Tuberc., October, 1930, xxiv, 175.*—(*R. M. F.*)

Surgical Treatment of Pulmonary Tuberculosis.—Surgical treatment, always an adjunct to medical treatment, is resorted to in cases (1) with so called lowered resistance,

(2) those with chronic fibroid tuberculosis in which the fibrosis, while more or less checking the spread of bacilli, eventually greatly diminishes the volume of the lung, (3) those with cavities that cannot be cured by medical means, and (4) those with serious, recurring haemorrhage. Surgery aims to produce rest of the lung, to remove the bad effects of tension, etc., from the fibrosis, to abolish cavities and prevent haemorrhage. These ends are obtained only by collapse, which may be effected by artificial pneumothorax, oleothorax, phrenicectomy, pneumolysis, thoracoplasty and neurectomy. Adhesions or a mobile mediastinum, particularly the former, prevent complete collapse by artificial pneumothorax in nearly one-half the cases in which it is indicated. Sanatorium care and frequent use of X-ray are essential to best results from this type of therapy. The use of the thorascope and the severing of adhesions by cautery or diathermy help increase the incidence of satisfactory collapse. Rupture of adhesions and formation of effusion are the two most common complications. Contraindications, aside from such conditions as cardiac or renal insufficiency or tuberculous enteritis, rest in the amount and type of disease in the contralateral lung, and this is always an individual matter. Frequently, selective or bilateral collapse is helpful in such a set-up. In oleothorax the oil used is either olive oil or paraffine, to which gomenol is added up to 5 per cent. Oleothorax may be used as a substitute for pneumothorax, but not as an alternative. It should never be used in a virgin pleural cavity, because it may produce a marked reaction. It is a disinfectant, it thickens the pleura and thus prevents herniation of diaphragm or mediastinum and at times actually compresses the lung. It is used particularly in pyopneumothorax, but only after the acute features have subsided. It may obliterate fistula and may prevent obliterative pleurisy in pneumothorax and may be used in pneumothorax when frequent refills are difficult; in this procedure, the intervals between refills are definitely lengthened. Olive oil is preferable to paraffine in treating effusions, for it is absorbed more rapidly than paraffine, but the latter is preferable when oil is used to increase the interval in pneumothorax. Oleothorax should be administered with great caution and the pleural response should always be tested by preliminary injection of 5 on 10 cc. of warmed oil. Subsequent doses may be given up to 30 cc. and then to 100 or 150 cc. "A big initial dose may produce an alarming reaction." The rise of the diaphragm after phrenic evulsion varies from 1 to 7 or 8 cm. The relaxation from abolition of tonic contraction of the diaphragm leads to diminution in the cough and pain that are associated with basal irritation or lesion, aids in returning the heart and mediastinum toward their normal position, and decreases tachycardia and dyspnoea. Indications are (1) basal tuberculosis (bronchiectasis is sometimes helped also), (2) more extensive tuberculosis with cavitation, (3) as an accessory to artificial pneumothorax (a) when adhesions are present, (b) to lengthen intervals, (c) to prevent (possibly) recurrence of adhesions, (d) protective,—to reduce the size of the hemithorax when pneumothorax is discontinued, (4) treatment of cough, tachycardia, dyspnoea, and (5) preliminary to thoracoplasty. Evulsion of 10 or 12 cm. of the nerve is preferable to section and gives complete paralysis. Apicolysis with paraffine is disadvantageous, for it irritates the pleura and may gravitate, especially if fluid is formed; with transplantation of fat, the latter may liquefy. Living grafts of pectoral muscle or breast give best results. The operation is not "particularly gratifying in its results." Partial thoracoplasty with removal of long pieces of the first four or five ribs gives much better results than extrapleural pneumolysis. Thoracoplasty is a much less formidable and serious procedure than it was a few years ago. More suitable selection of cases, better-defined indications, less ill patients, better technique and anaesthetization have all aided in this respect. Attempts to assess the eventual prognosis by sedimentation-rate tests and vital-capacity measurements have yielded the impressions that (1) decrease in the patient's sedimentation rate over several months prior to operation offers a fair index of a safe risk, (2) vital-capacity estimations offer no such help. The general state of the patient has most to do with determining whether the operation should be done. Thoracoplasty is unable frequently to close large apical cavities and should be performed before this stage is reached, when possible. Subsequent apicolysis sometimes prevents the spread of infection or the haemorrhage which may follow an incomplete closure. The value of partial thoracoplasty is questionable or doubtful. The patients with greatest collapse are the one who do best. Concerning the more remote results it may be stated that of 112 patients the mortality within three months of the operation was 4.5 per cent, the causes being pulmonary embolus in 1 case, pneumonia in better lung in 3 and heart failure in one. Forty-five and seven-tenths per cent of those operated upon were able to work; 85 per cent were slightly improved; 3.2 per cent were unchanged or worse and 17 per cent died later than three months after the operation. Pyothorax responds more favorably to thoracoplasty than

to repeated aspiration with its attendant sinus tracts, etc.—*The Present Position of Surgical Treatment of Pulmonary Tuberculosis, H. M. Davies and A. T. Edwards, J. State Med., October, 1930, xxxviii, 594.*—(*H. S. W.*)

Collapse Therapy.—Collapse therapy is being used more and more in early lesions. Not every early infiltration should be treated by collapse therapy, but as soon as cavitation occurs pneumothorax should be induced. Lesions in the contralateral lung are not any more considered as strict contraindications as they used to be, especially since bilateral pneumothorax may be used with advantage. If possible it is preferable to collapse first one side and after reëxpansion the other side, but simultaneous bilateral pneumothorax yields good results in some cases. In patients who have a vital capacity of less than 2,000 to 2,500 cc. bilateral pneumothorax is contraindicated. When during the reëxpansion of the collapsed lung signs of mediastinal shifting occur, oleothorax or phrenicectomy is advised. It is pointed out that the occurrence of a spontaneous pneumothorax during collapse therapy is more frequent than usually recorded. Effusions during collapse therapy should be treated with tuberculin. The prognosis of collapse therapy depends largely on the social status of the patient. If he is able to take good care of himself during the whole course of the treatment the prognosis is much more favorable than in patients who must work during the treatment. In cases in which single adhesions prevent the collapse of cavities intrapleural pneumolysis is indicated. Oleothorax should be induced when adhesive pleuritis threatens to obliterate the pneumothorax space, in tuberculous empyema and in some cases in which cavities are not collapsed by the pneumothorax. If the induction of pneumothorax is impossible phrenicectomy should be tried and should be complemented by thoracoplasty if necessary. Pneumothorax is advisable in some cases of pulmonary abscesses and gangrene. It usually does not yield any results in fully established bronchiectasis. But in early cases of bronchiectasis in children, collapse therapy may yield good results. Pneumothorax and thoracoscopy may be used as diagnostic procedures.—*Lungenkollapstherapie, A. Frisch, Wien. klin. Wchnschr., January 23, 1931, xliv, 114.*—(*M. P.*)

Collapse Therapy.—Collapse therapy includes artificial pneumothorax, operations on the phrenic nerve, and thoracoplasty. All give added rest to the lung by limiting the respiratory excursion of the lung. All allow relaxation of the elastic tissue of the lung and correspondingly a decrease in size of cavities or other lesions. There can only be two reasons for not immediately instituting some form of surgical collapse for unilateral lesions, one being that the lesion is so small that one is optimistic enough to believe it will get well on bed-rest alone; the other that such a measure could not help. It is a benign lesion indeed in which at least a crushing of the phrenic nerve should not be resorted to in order to give the patient the benefit of the additional rest afforded while the diaphragm is paralyzed. Collapse therapy in some form should be used when bed-rest has been tried and the lesion is not healing. The author is not convinced that any of these measures have been the direct cause of spread or activation of disease in the other lung. Collapse therapy may be carried on even when both lungs are involved provided the vital capacity is not too low. If necessary, partial bilateral collapse may be used. It is to be noted, however, that successful collapse of the most affected lung often results in healing of the lesions in the contralateral lung. In discussing the paper the author points out that although these procedures are attended by some risks, they are used in treating a serious condition and a certain degree of risk is justified.—*Mechanics of Collapse Therapy and its Indications, E. J. O'Brien, Arch. Surg., December, 1930, xxi, 1134.*—(*R. D.*)

Medical Aspects of Thoracic Surgery.—The medical aspects of thoracic surgery involve (1) the diagnosis of the condition requiring operation; (2) the assessment of the patient's suitability for operation, (3) the choice of surgeon; (4) the discussion of the operative measures proposed and their adaptation to the condition present; (5) the preparation for operation and the after-care of the patient, both immediate and remote; and (6) the decision as to the time for surgery, Emergency operations are confined to (1) relief of positive pressure in valvular pneumothorax; (2) immediate artificial pneumothorax in cases of severe or recurrent haemoptysis, (3) partial aspiration of a large effusion causing oedema of the opposite lung or dangerous mediastinal displacement; (4) aspiration of empyema in a seriously ill patient, as a preliminary to effective drainage; and (5) tracheotomy in bilateral abductor paralysis from pressure on both recurrent laryngeal nerves. Artificial pneumothorax, phrenic evulsion, thoracoplasty, apicolysis and lobectomy, have proved of great value in the treatment of thoracic diseases.—*The Medical Aspects of Thoracic Surgery,*

R. A. Young, Brit. M. J., November 8, 1930, no. 3644, 763.—(M. E. P.)

Indications for Pulmonary Collapse.—The usual procedure in pulmonary tuberculosis with cavitation, after bed-rest has been tried, is collapse therapy, either as pneumothorax or phrenicectomy, alone or together, or as thoracoplasty. Each of these procedures has its own particular set of indications: Artificial pneumothorax is indicated in fresh cavities. Adhesions may be stretched during treatment or cut à la Jacobaeus. Bilateral disease may be influenced favorably by pneumothorax and the postulate of the necessity of a good, disease-free contralateral lung is no longer absolute. Phrenicectomy acts by lessening pulmonary tension and may produce a favorable influence on any part of the lung. It leads to closure of cavities, particularly small ones, in any situation in the lung. Extrapleural thoracoplasty is indicated in the lung with extensive disease, cavity and adhesions, but the patient must have a good cardiac reserve. Combination of pneumothorax and phrenicectomy is justified only at the end of pneumothorax treatment. It may prevent mediastinal shifting as a result of reëxpansion. It favors pulmonary contraction. Combination of pneumothorax and thoracoplasty is indicated in cavernous upper-lobe processes with adhesions and incomplete pneumothorax. The upper eight ribs may be removed at one operation. The pneumothorax may be allowed to reëxpand later. Combination of phrenicectomy and thoracoplasty: Phrenicectomy is preliminary to thoracoplasty. As a test operation for thoracoplasty it is not reliable. Cases suitable for thoracoplasty cannot be healed, but phrenicectomy, especially on the right side, may be disadvantageous to thoracoplasty, as the displaced liver acts as a hindrance for the horizontal collapse of the lung.—*Die besonderen Indikationen der einzelnen Lungenkollapsverfahren, H. Jessen, Deutsche med. Wchnschr., June 13, 1930, lvi, 1003.—(H. S. W.)*

Key to Abstractors

A. P.: Andrew Peters, Pittsfield, Mass.
E. H. K.: E. H. Kerper, Loomis, New York.
F. G. P.: Frank G. Petrik, Loomis, New York.
G. L. L.: George L. Leslie, Howell, Mich.
H. J. C.: H. J. Corper, Denver, Col.
H. S. W.: H. S. Willis, Northville, Mich.
M. E. P.: M. E. Parker, Kalamazoo, Mich.
M. P.: Max Pinner, Tucson, Arizona.
R. D.: Richmond Douglass, Loomis, New York.
R. M. F.: R. M. Franklin, Loomis, New York.
U. E. Z.: U. E. Zambarano, Providence, R. I.
W. I. W.: Walter I. Werner, Pontiac, Mich.